Chronic Kidney Disease

Key Facts:
- Many people with CKD will never develop end stage renal disease; however they are all at increased risk of cardiovascular disease
- The main risk factors for CKD are age, hypertension, diabetes (poorly controlled), acute kidney injury; HIV and inflammatory conditions such as RA. Also NSAIDs and other medications
- It is normal to drop 1 eGFR point with each year of life

Diagnosis of CKD

- Only diagnosed if there are ***two low eGFR / high creatinine readings at least 3 months apart***
- Calculate eGFR from creatinine using a calculation tool (e.g. MDCalc using 2021 CKD-EPI equation)
- If first raised creatinine – see separate protocol 'raised creatinine'
- Assess rate of change in eGFR / creatinine to indicate the rate of progression of CKD – discuss with consultant if rapid progression of CKD
- In women of reproductive age, ensure not pregnant

Classification of CKD

CKD stage	eGFR	Monitoring
1	>90	Look for and manage any underlying conditions. Good control of diabetes and hypertension will protect kidneys - see relevant protocols. Stages 2 + 3a - avoid medication which could make worse (NSAIDs); annual creatinine if not already indicated as part of regular disease monitoring. If persistent proteinuria (no UTI) – manage as for stage 3b
2	60-89	
3a	45-59	
3b	30-44	Monitor 6 monthly is stable, 3 monthly if worsening
4	15-29	Monitor 3 monthly if stable, more often if deteriorating
5	<15	

Management of CKD stages 3b-5 (and 1-3a with proteinuria)

1. Investigations:
   - Urine dipstick to check for proteinuria –
     At diagnosis and then annual unless previously diagnosed with proteinuria *(once someone has proteinuria due to CKD, it is unlikely to resolve so no need to retest unless UTI symptoms)*
     Further urinalysis if ?UTI (symptoms, may be other features on dipstick)
     Treat proteinuria with ARB or ACEI
   - USS at diagnosis (for baseline, kidney size, reversible causes)
   - Creatinine at diagnosis then after 6 months. If stable can do annually. Watch for progression.
   - Hb at diagnosis then annually and work up for anemia if low (note that anemia not due to CKD unless eGFR<30)
   - If not known diabetic - HbA1C at diagnosis (if not within 12m)
   - Check HIV status and advise testing if unknown
   - Na/K? Not required routinely – check if clinical concern or depending on medication
2. Patient education:
   - Need for follow up - CKD is asymptomatic but progressive, need good chronic disease management
   - Diet and lifestyle – drink plenty, healthy weight, no smoking, low salt diet, physical exercise, avoid NSAIDs and herbal medications, avoid dehydration (!!if Muslim need to discuss Ramadan – increases risk of AKI, worsening of CKD and may increase the risk of CVD, may need medical exemption)
   - Vaccinations - recommend flu (annual), Covid, HBV and pneumococcal (5 yearly)
   - Women of reproductive age ?family planning
3. Check fluid status and weight (fluid overload?), pulse rate (AFib?), BP

4. Prescribing (cardiovascular risk reduction is key):
   - **Optimise management of any underlying conditions** (see specific protocols)
   - **BP control (aim <140/90; if proteinuria aim <130/80);** use ACEI/ARB 1st line (see 'prescribing in CKD)
   - Aspirin 75mg od if Hx CVD
   - Offer atorvastatin 20mg od if can afford long-term, BUT BP/diabetes control more important
   - **Check medication** - stop/adjust doses of drugs according to eGFR (see box and refer to information for specific drugs)

Management of CKD 4 + 5 (discuss with consultant at every review)

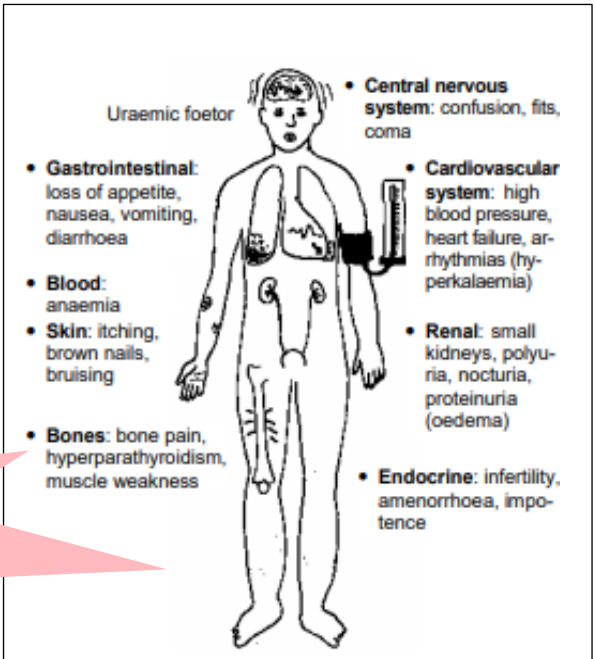
As above **AND:**

5. Refer to nutritionist (low salt, low phosphate, low potassium, low protein)
6. Investigations:
   - **Creatinine** – rate of change will indicate prognosis, check every 3 months (or more often if deteriorating)
   - **Na/K?** – at least yearly, or depending on clinical indications and medication
   - **CBC** – if signs of **iron deficiency anemia** – check for blood loss / underlying cause other than CKD - treat with ferrous sulphate alternate days for 3 months (take on empty stomach) then recheck, aiming for Hb 10-12g/dL; discuss with consultant if not increasing to consider diagnosis, further investigations and ?IV iron
   - **Phosphate and calcium** – if normal check six monthly; if high phosphate or low calcium – treat with Calcium/vit D, one tablet with each meal (for phosphate binding) and recheck after 3 months, ensure low phosphate diet.
     If no improvement to phosphate or calcium levels with Ca/Vit D supplements, start higher dose Vitamin D3 (e.g. 60,000IU per week); recheck phosphate and calcium again after 2-3 months.
7. Advise 1 teaspoon of bicarbonate in a glass of water twice daily (to prevent metabolic acidosis)
8. **Symptom control** (often asymptomatic early on but increasing symptoms as urea rises – see figure):
   - If fluid overloaded, then use loop diuretic rather than thiazide (may need high doses)
   - Itching (can try cetirizine 10mg od), topical emollient
   - Recurrent gout – allopurinol 100mg od
   - Nausea (antiemetics), hiccups (promethazine, chlorpromazine)
9. **Discussion about future management, possible referral/dialysis** (see separate guideline – *consider* especially if: younger patients (<50y) with progressive CKD (25% change in creatinine/eGFR over 3 months) or renal failure of unknown cause.

No need for routine checking of urea, PTH, ALP or uric acid!

Consultant review:
All CKD 4/5 patients
If rapid progression of CKD
If considering referral for dialysis
Persistent Hematuria
Electrolyte abnormalities
Severe anemia, or anemia not improving with iron

If dialysis is not appropriate, continue this
Comprehensive Conservative Management of CKD
- CKD is not curable but there is much that can be done
- Actively manage CKD and any co-morbidities
- Symptom control
- Consider palliative care referral – especially if progression of disease / deterioration in condition



Signs and symptoms in chronic renal failure

Prescribing in CKD

Commonly used drugs that CAUSE renal failure	Drugs that can BUILD UP in renal failure
Antihypertensives: **ACEI/ARB** – important for protecting the kidneys but can cause deterioration in renal function • check creatinine 1-2 weeks after starting and 1-2 weeks after any dose increase: - if creatinine rises 15-30%, continue ACEI/ARB and repeat creatinine in 1-2 weeks - if creatinine rises >30%, stop ACEI/ARB, return to previous dose and recheck in 5-7 days • do not give in pregnancy • when ACEI/ARB used in CKD stage 5, watch K^+ and creatinine closely **Diuretics** – check creatinine 1-2 weeks after starting or after any dose increase, use loop diuretics if fluid overload, thiazides ineffective in CKD4/5, avoid spironolactone as risk hyperkalemia, hydralazine – reduce dose if CKD 4/5 (Beta-blockers and CCI are safe in CKD)	**Metformin:** reduce dose if CKD 3b (eGFR 30-45); stop if CKD 4/5 (eGFR<30) **Opioids**: use lower doses and may only need to give once every 24 hours Digoxin Lithium
Other medications: NSAIDs and aspirin (paracetamol is safe) PPIs and H2RA Antibiotics including aminoglycosides, cotrimoxazole (septrin) and cephalosporins Protease inhibitors (lopinavir/ritonavir - Kaletra) Lithium Some chemotherapy Dyes/contrast used in radiology imaging **Check all drugs you prescribe for renal dosing!!**	**Other considerations** **Calcium/vit D** – a common supplement in CKD 4/5 – to take with meals but ensure that other medication is taken *at different times* (as calcium/vit D will reduce absorption)

References:
Consultation with Dr Joe Watlington, visiting nephrologist February 2022
Kidney International Supplements (2013) 3: 4-14; KDIGO
Practical Guide to Common Medical Problems, Malte von Blumröder, IAM, 2005
2019 Clinical Guide Primary Care International *(adapted for this context and location. PCI have not been involved in, nor hold responsibility for any adaptations. Original can be found at:* https://ncd-training.org/open-source-clinical-guide/)